

# The Jersey Broadcaster

NEWSLETTER OF THE NEW JERSEY ANTIQUE RADIO CLUB

December 2005

Volume 11 Issue 12



## MEETING/ ACTIVITY NOTES

Reported by Marv Beeferman

Membership Secretary Marsha Simkin reports that we'll have a nice turnout for our holiday party on Saturday, December 10th. As of December 1st, we had 80 reservations and we're still counting. This year, we've eliminated the mixer to get started on time and leave a little more room for the buffet, but some soda and snacks will be available starting at 5:30. As promised, here are the rules for our Mystery Grab Bag (so it will no longer be a mystery) where a wrapped, radio-related gift (new or used/approximate \$20 value) is the entry fee:

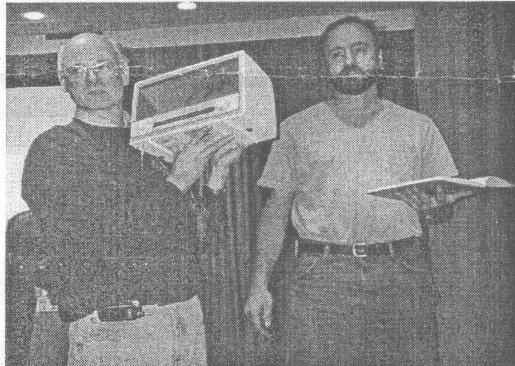
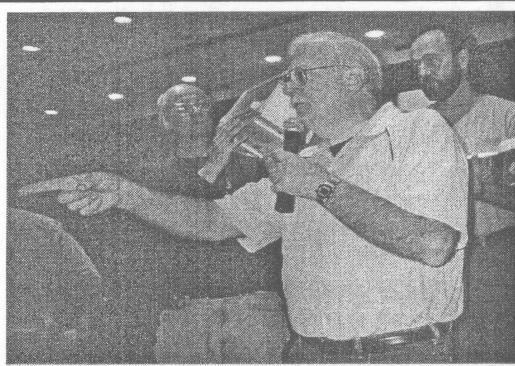
1. Each player's name is placed in a hat.
2. Two gifts are chosen at random and marked "Do Not Open."
3. The first person whose name is drawn may select a "Do Not Open" gift (which cannot be unwrapped until the end of the game) or any other un-opened gift. This gift is unwrapped and shown to all the other players.
4. A second player's name is then drawn and a gift is selected but not opened immediately. This player has two choices: to either exchange it unseen with the first player's unwrapped item or keep what was chosen.
5. If the second player selects a "Do Not Open" gift, it remains wrapped under all conditions. If a swap was not made with the first player's unwrapped gift, the second player's choice is unwrapped and shown to all players. If a swap was made with the first player, the first player unwraps his gift and shows it to all players.
6. Play progresses with each new player having the opportunity to "steal" any unwrapped item in the "pot" in exchange for a wrapped gift that was chosen. However, the

same unwrapped gift may only be stolen once in each round.

7. Player's left with "Do Not Open" gifts at

back, in your pocket, under your skirt or behind the stage curtains.

9. As always, spite, malice, ill-will, malignity, retaliation, revenge and reprisal are all encouraged. As Dante said: "Abandon good nature all ye who enter here!"



Mini-auctions seem to be a standard event at our monthly meetings. Here, Phil Vourtsis, Richard Lee and Sal Brisindi do the honors.

the end of the game (all names drawn) are stuck with what they are left with...no exchanges allowed.

8. Unwrapped gifts must be kept in view at all times. They can't be hid behind your

Last month's meeting featured a talk and demonstration of military field radios by Al Klase and Rob Flory. Members got a close-up of an RT-77/GRC-9 ("Angry 9") backpack or vehicular transceiver. It was a 2-12 MHz, AM/CW low power radio set that was fielded in the late 1940s and used through the Korean War and later in the 1950s. We also examined a CRI-43044 transmitter-receiver. A unique item was Rob Flory's BC-1016 recorder that was used to record Morse code at up to 400 wpm on point-to-point circuits. Operators visually read the slips that were produced as they passed above a typewriter at about 25 wpm. (See page 8 for photos.)

Ray Chase reports that significant progress has been made at Infoage:

"We now have full access to the Marconi hotel and associated buildings. A formal transfer ceremony has been scheduled for April 1, 2006. At this time we will take possession of 37 acres and 16 buildings including the cottages and the Diana site that we currently have. It in-

**THE JERSEY BROADCASTER** is the newsletter of the New Jersey Antique Radio Club (NJARC) which is dedicated to preserving the history and enhancing the knowledge of radio and related disciplines. Dues are \$20 per year and meetings are held the second Friday of each month.

The Editor or NJARC is not liable for any other use of the contents of this publication.

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cludes the hotel, the library (L-shaped buildings), telephone exchange and a few other minor buildings. It does not include the two large "H" buildings and the receiver building at river's edge that are still subject to further environmental issues, but work is progressing on the H buildings. The turnover will be a big affair and we will be tasked to show many dignitaries who have supported us for many years what we really can do. If you have not seen the Marconi hotel recently, you really should come by on a Sunday and check it out. Many groups have put in a lot of effort and the improvement is spectacular. The InfoAge board has been meeting every couple of weeks to now take up the challenge of funding our programs and planning how to use the facilities. We now have a vintage computer group as part of our family of supporting organizations. On January 7th we will celebrate the 60th anniversary of Project Diana, the bouncing of radar signals off the moon for the first time. I will try to generate some additional displays and history so that it better recognizes the history of radar signals from the moon in addition to being a special day for HAMs.

In March there will be an East Coast vintage computer festival at the site and then our transfer ceremony on April 1st. In-between, there will be school groups and other public events...exciting times for us at InfoAge after many years of frustration."

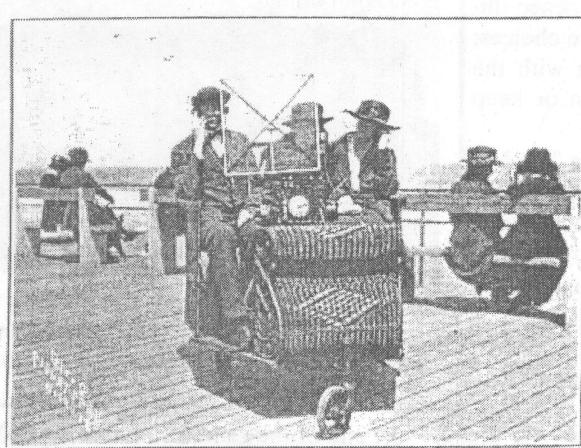
Al Klase was contacted this weekend to support a display by the Ocean Township

Historical Society with a link to station 2XJ. In 1920, AT&T began to develop vacuum-tube radio transmitters for commercial services. Its experimental station, 2XJ, located in Deal Beach, and operated by its Western Electric subsidiary at about 400 meters, began transmitting test programs in March 1920, which included selections by famous artists, band music, humorous pieces and lectures. The program was broadcast every Tuesday evening, starting at 10 o'clock and ran until midnight with a range of a few hundred miles. An interesting article in the August, 1920 Radio News describes a battery set and loop antenna installed in an Asbury Park boardwalk "roller chair" with the occupants listening to the broadcast.

The club supplied a Westinghouse RA/DA receiver with Western Electric earphones. Club pamphlets were left next to the display with the hope of making some new contacts.

## Upcoming Events:

- 01/13/2006: Members-only auction.
- 01/20-29/2006: NJARC Broadcast Band DX Contest
- 01/28/2006: Repair clinic at Sarnoff Library.
- 02/10/2006: NJARC Homebrew AM Receiver Contest judging.
- 03/18/2006: NJARC Spring Swapmeet, Parsippany NJ
- 04/01/2006: InfoAge dedication ceremony.



By Means of a Radiophone Set Installed on a Roller Chair, Summer Visitors to Asbury Park May Now Enjoy Concerts While They Traverse the Boardwalk's Length. The Chair Occupants Are Listening to a Phonographic Concert Many Miles Away.

**DX'in 2XJ on the "boards" at Asbury Park.** The article states that W. Harold Warren and his sisters are conducting tests in preparation for the evening broadcast. Batteries are located below the dashboard of the roller chair. The "apparatus" is described as an eighteen inch loop, an audion detector and amplifier, so compact that "three persons can sit comfortably with it in the chair."

## THE SCR-73 AIRPLANE RADIO TELEGRAPH SET

Edited by Marv Beeferman

Practically the only type of US-designed and manufactured radio equipment which was produced in enough quantity to be of any service to American troops in France during WW I, and which could hold up in a warfare environment, was an airplane transmitter known as the SCR-73. It was developed by the famous Frank Conrad who, in 1918, was an Assistant Electrical Engineer at Westinghouse.

The SCR-73 was designed for use in fire control airplanes which sent target information to gun emplacements within the effective range of the transmitter. In general, the set was a simple, rotary gap, indirectly excited spark transmitter with power supplied from a self-excited, inductor type alternator driven by a special constant speed "airfan" (propeller). All components were self-contained in the streamlined casing of the alternator, which was generally mounted on the underside of the plane's fuselage where it was in the air stream of the propeller. The only equipment mounted inside the fuselage was three sending keys, the field and battery switch, a dry battery in its holder, a variometer and the antenna reel.

The set was provided with nine taps on its "oscillation transformer" for the selection of nine different wavelengths and with five different toothed discs for the rotary spark gap to give five different signal tones. Thus, 45 different combinations of wavelength and tone were available to operate a large number of fire control airplanes in a comparatively small area without interfering with each other.

Wavelength and tone adjustments were made prior to takeoff since these adjustments were not accessible to the pilot or his observer. Once in the air, the only adjustment the observer required making was to adjust a variometer for maximum circuit resonance as indicated on a hot wire ammeter.

Since the French were using powerful

sets at the time, the transmitter was rated at 200 watts to prevent interference during operations in the same section of the front. The higher power would also ultimately allow the possibility of using a fixed antenna (requiring a greater energy input for equivalent radiation) in place of the original trailing antenna.

### Major Components

**Generator -** Power was supplied by a 200-watt, "inductor type" alternator rated as a 4500 rpm, 116-120 volt open circuit, 900 cycle generator. The commutator on one end of the rotor delivered direct current to the field coils. One side of this circuit was carried to a distribution block to facilitate connecting a field switch and dry battery for use as an auxiliary means of exciting the field. This was considered only a temporary provision until the generator became self-exciting.

**Airfan -** The generator was driven by a 20-inch, two-blade airfan at a relatively constant speed for wide variations of air velocity. This was accomplished by means of a centrifugal governor mounted at the center of the fan, which changed the pitch of the blades to compensate for different air speeds. The governor used the equilibrium of the opposing forces of centrifugal weights and compression springs to maintain the speed of the generator within +/- 4% of 4500 rpm with air speed variations from 50 to 175 mph. Since the transmitter would operate satisfactorily with power outputs corresponding to speeds between 4000 and 5200 rpm, this was well within desired limits.

**Rotary Spark Gap -** This unit consisted of a rotary brass disc forming one electrode of the gap and a piece of tungsten forming the opposite or fixed electrode of the gap. The brass disc was mounted on an insulating hub, which was keyed to the shaft of the alternator. The stationary tungsten electrode was mounted in an insulating block and held by an adjustable bracket clamped to the hub of the alternator. Five interchangeable discs were furnished with the set with 6, 8, 12, 17, and 24 teeth respectively corresponding to "tones" of 450, 600, 900, mixed tone, and 1800 sparks per second.

Following installation of a disc, the spark gap would require angular and radial ad-

justment of the stationary electrode. The first determined when the spark would occur with reference to the cycle of generator voltage and the second determined the length of the gap between the stationary electrode and the rotating teeth as they passed.

In order to dissipate heat and carry off the gases produced by the spark, special ventilating holes were provided in the SCR-73 housing. The holes also caused a stream of air to flow through the housing to assist slightly in quenching the spark.

**Power Transformer/Condenser -** The closed core power transformer stepped up the voltage supplied by the alternator. The condenser, part of what was termed the "closed oscillatory circuit," used mica as a dielectric and had a value of .004 mfd. It was mounted in an open aluminum frame and was coated with a special compound that protected it from moisture.

**Oscillating Transformer -** This transformer consisted of a solid bare copper wire wound in grooves around a hollow bakelite cylinder fastened to a bakelite disc which was mounted on a short shaft held in the set's frame. Nine primary taps were brought out to contact buttons on the disc with each button marked with its corresponding wavelength. Connection to the buttons was made by means of a spring contactor that held the cylindrical transformer in position. To change the connection, the spring contact was pulled toward the air fan and the cylinder rotated to the desired wavelength.

Seven secondary taps (A-G) were provided to change output power from maximum to 1/16 of full radiated power. A simple lever switch that pivoted about the axis of the cylinder was used to select the power tap. Output current was delivered to the antenna through a special coil spring and socket connector. This flexible connection facilitated taking the unit's casing off to make wavelength and tone adjustments without disturbing the connection from the casing to the variometer.

**Variometer -** The variometer was installed along with a hot wire ammeter in a wooden box mounted in the airplane's fuselage between the pilot and observer cockpits where it could be reached by the observer for making adjustments. It was used to tune the antenna to the wavelength of the

transmitter output. Inductance was variable between .035 and .40 millihenrys. Inductance was varied by means of a trolley that made contact with the coil turns. A handle moved the trolley on the cover of the box that rotated a pinion connected to a ratchet on the trolley. A brass disc moving with the trolley inside the coil served to insulate or short circuit magnetic lines of force to prevent losses in the shorted coils. It also served to make changes in inductance more gradual.

A table was provided to the operator which gave the wavelength in meters associated with each antenna length and the "power tap" to be used for maximum radiation. For example, a 200-foot antenna would be used for 291 meters with maximum output on power tap "E."

The hot wire ammeter, used to measure output, was mounted in the variometer box and covered with a glass window for the operator's protection. It read from 0 to 2.5 amps and constructed for a relatively stable reading despite airplane vibration.

**Sending Keys and Winker Lamps** - The SCR-73 was equipped with three flame-proof, adjustable, heavy-duty keys. A bayonet type socket for a 130-volt Mazda "winker" lamp was mounted on the base of

each key - ON with the key open and OFF with the key closed. Based on the lamp's brilliance, an indication of the voltage being delivered by the generator was provided. The lamp also notified either the pilot or the observer when the other was sending so they wouldn't interrupt each other. The possibility also existed that the lamp assisted the operator in properly sending code by providing him with a visual indication of the dot and dash spacing.

### Operation

In ordinary use, a designated wavelength and tone was assigned to each airplane before it took flight. Usual practice was to assign one note to each squadron and different wavelengths to each plane in the squadron.

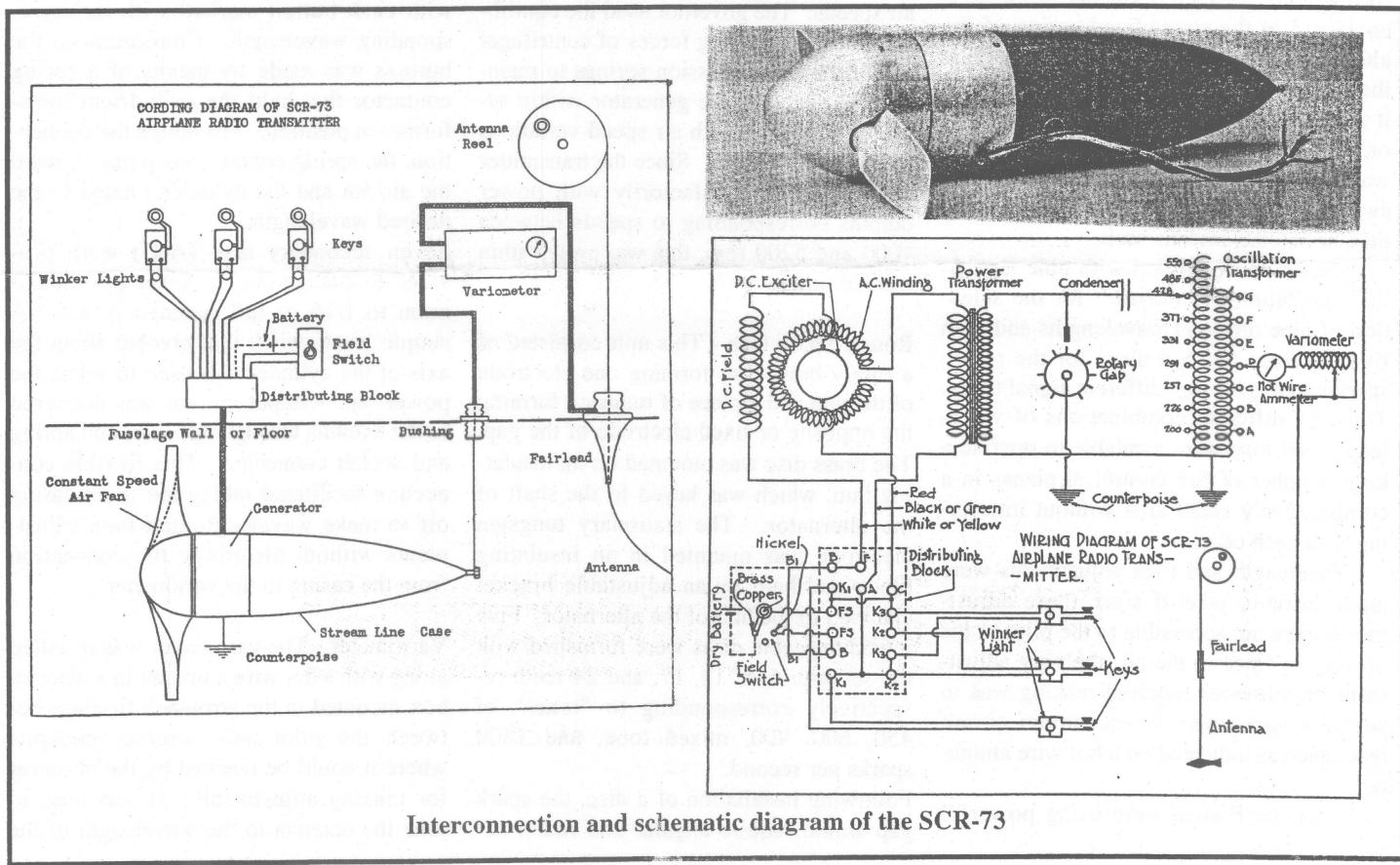
First, the unit's case was removed and a rotary disc with the proper number of teeth for the tone assigned to the squadron was installed. Angular and radial adjustments were then made to the rotary spark gap, the transformer was rotated to the desired wavelength tap and the proper power tap was selected for the length of antenna wire to be rolled out. With the plane still on the ground, its engine running and a type A-51

dummy antenna connected, the set's field switch was closed and the brilliance of the winker lamps noted. Each sending key was depressed and the hot wire ammeter reading verified. (A small motor for driving the generator without running the plane's engine was also provided with the SCR-73).

After attaining a safe altitude, the observer would let out the pre-determined length of antenna wire. The field switch was then closed; if the winker lamps didn't glow, the switch was momentarily taken to the battery position to flash the generator's field. Then the sending key was depressed and the variometer handle turned until the hot wire ammeter indicated maximum output.

### References:

1. Radio Age, Vol. 14, No. 1 (January 1988), "SCR-73 WWI Airplane Transmitter"
2. Signal Corps, U.S. Army, Radio Pamphlet No. 13, "Airplane Radio Telegraph Transmitting Set, Type SCR-73", 6/30/1918 (Provided by Marsha and Jerry Simkin).



## STATION "WEE"

There's a particular type of story that doesn't seem to get much play anymore. It usually follows along the lines of the guy who built a scale replica of the Eiffel Tower from toothpicks or a working model of a steam locomotive from discarded beer cans. But in earlier years, when free time wasn't filled by video games and reality shows, these types of projects seemed to abound and they received quite a bit of publicity. Thanks to a four-page booklet provided by Marsha and Jerry Simkin, we find that even radio was no less a target for the miniaturization crowd.

The booklet describes station "WEE," the world's tiniest radio broadcasting station (nice play on words). While reading this reproduction, you'll notice that some of the claims, like "leading radio engineers all over the country were mystified by its remarkable tone quality," are a little far-fetched. But how else can you hype the station's value up to \$25,000?

I hope you'll have some fun noting the unique construction details of this little gem. I do apologize for the picture, however, but the original reproduction was just as bad and I thought you would like to get at least some idea of what the thing actually looked like.

# SEARS, ROEBUCK AND CO.

*presents*

The World's Tiniest Broadcasting Station . . .

## STATION "WEE"



Actually broadcasts 200 feet on a total power of four one-hundredths of a watt!

Valued at \$25,000.

## The Story of

### "Wee"

The World's Tiniest Radio Broadcasting Station  
on display at Sears, Roebuck and Co.

Station "Wee" is the only thing of its kind in existence and has been proclaimed a scientific wonder in miniature by radio authorities.

Station "Wee" is seven years old and has traveled 125,000 miles throughout the country, being conveyed entirely by automobile. Station "Wee" has been exhibited to hundreds of thousands of onlookers who have marvelled at this tiny radio station after having seen and heard it in operation.

Station "Wee" was constructed from a mental picture. No plans were used in its make-up and practically every bit of it was built by hand. It took two years. The originator, builder and owner of "Wee," John R. Boyle, of Philadelphia, Pennsylvania, when asked how he came to build this Tom Thumb broadcasting station, said, "The idea came to me over night. My most intimate friends thought the idea foolish, and felt if Station 'Wee' were created, due to its small size, it would have poor musical quality. It was quite a thrill for me when 'Wee' was completed. Leading radio engineers all over the country were mystified by its remarkable tone quality."

Station "Wee" is 64 inches long, 20 inches high, and 20 inches deep. Its total weight is 200 pounds. The towers are 24 inches in height, constructed of solid brass, weighing 5 pounds each. There are 112 steps in the little ladders, which ascend the sides of the towers, and 1,024 hand-soldered joints are used in their construction. It has been estimated the insulation on the antenna will stand 4,000 volts. The little red lights are a warning to airplanes at night time. There are imitation concrete bases at the base of the towers, and a real roof on the building. The ceiling lights operate from the house current, the same current you use in your home for household electrical appliances, such as radios, electric refrigerators, etc. Station "Wee" has 400 feet of wire in the lighting system alone! There are 50 combinations of lighting effects throughout the station, and 21 miniature lights, which are controlled by the transformer in the generating room delivering 6 volts.

Station "Wee" is a combination of screws, nails, glue, wood, rubber bands, nail polish, parts from automobiles, talcum powder cans, paper clips, washers, etc. The danger lights are covered with nail polish. The floor lights are

made of brass tubing, paper clips, and the shades are covered with silk ribbon.

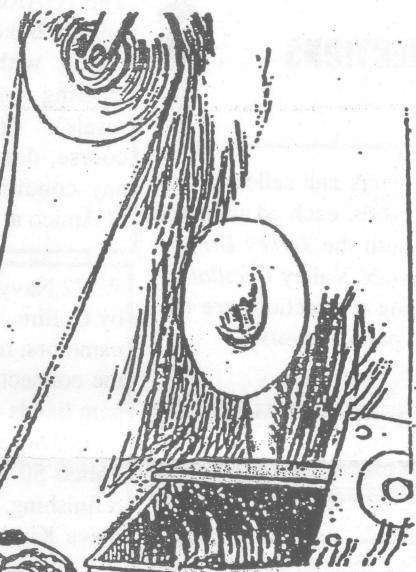
In the studio there is a seven-piece miniature orchestra. The movements of this mechanical orchestra are controlled by a rheostat in the control room. They will move at any speed, jazz or waltz time, and the movements are made possible by a 1/30 H.P. electric motor concealed beneath the studio, assisted by belts, pulleys, eccentrics, wire and rubber bands. The figures have china heads. The bodies are carved from wood. The arms are made from tin cans, the legs are lollipop sticks.

The book on the announcer's desk originally was a miniature dictionary, cut smaller with a razor blade. The reading light on the announcer's desk in the studio was made from part of an oil can, a piece of brass, and a section of a gasoline line from an automobile.

There are five miniature microphones throughout Station "Wee" and the name of "Wee" on these microphones is hand engraved. These were made from brass tubing and paper clips. The microphone on the operator's desk in the transmitting or control room was made from a washer, a nail, and the gear wheel from an alarm clock. The furniture in the reception room was made from wood painted to have a silky finish. The lights on the piano in the studio and on the reception room table were made from a cotton spool. The chimes of the grandfather's clock are brass tubing and the pendulum is a washer. The telephone operator is seated on a swivel chair that can be raised or lowered 1 1/4 inches, and the switchboard has twenty plugs. The little standard time clock in the control room tells the correct time, and the telephone on the operator's desk was constructed from a paper clip, piece of string, washer, and a part of a safety razor handle. Hardly large enough to see on the operator's desk, is a wireless key. This key was filed from a 1/2-inch piece of brass. The window shade in the control room has a piece of string and a washer as a puller. The flower located on the end table in the reception room was made from wire and glue, and the base or the pot is the lid from a talcum powder can.

The cost to build Station "Wee" is unknown, due to waste of material, experiment, and time. "Wee" is valued at \$25,000, although in reality it is priceless. Four 199-type tubes are employed in the transmitter — one microphone input, one amplifier, one modulator, and one oscillator. Station "Wee," under ideal conditions, has a sending radius of about 100 feet. Station "Wee" operates on a frequency on the standard broadcast band, 200 to 600 meters, 550 to 1500 kilocycles. The power of "Wee" is four one-hundredths of a watt, the lowest power ever possible to broadcast successfully on the standard broadcast band. Three dry cells and one 45-volt B battery supply the transmitter with power.

Station "Wee" with its four one-hundredths of a watt power, consumes less electrical energy than the tail light of any automobile. Station "Wee" is one twelve-millionth the power of WLW, the world's most powerful radio station — 500,000 watts. WLW consumes as much electrical energy as a city with a population of 150,000 people.



### CHRISTMAS, 1924

By Charles H. Van Housen

Up in his shop in the Land of Snows  
 Santa is building ra-di-ohs!  
 Jolly and merry and ruddy and quaint -  
 Up-to-date, old-fashioned, modernized Saint!  
 Thousands of "plexes" and "flexes" and "dynes"  
 Built along fancy and fashionable lines!  
 Cute little crystal sets - jim-dandy toys  
 Made by Saint Nich'las for good girls and boys!  
 Sets by the dozen and sets by the score -  
 Ten tubes and one tube and three tubes and four!  
 Piled in his store-room in gala array,  
 Tagged: "Do Not Open Before Christmas Day!"  
 Cabinets, batteries, panels and wire -  
 Anything, everything fans could desire!  
 Rheostats, sockets and soldering-lugs,  
 Ground-clamps, condensers, transformers and plugs!  
 Wave-traps and meters and toolchests and books  
 Tucked away safe in the corners and nooks  
 Of that jolly big workshop 'way up in the snows  
 Where Santa is building our ra-di-ohs!  
 Tune up your hearts, folks, 'most any night -  
 Sweet from his mansion so glist'ning and white  
 Comes the announcement: "Station North Pole!  
 Santa Claus speaking! To every good soul  
 My very best wishes! I'm glad you believe  
 In Santa! Just look for me next Christmas Eve!  
 I'm not used to talking. Please pardon this cough!  
 God bless all the kiddies! S.C. 'signing off!"

The above poem and illustration is courtesy of "The Radio" section Philadelphia's *Evening Public Ledger* for Saturday, November 29, 1924...Ed.

**CONNECTIONS**

Free exposure for buyers and sellers! Unless requested otherwise, each ad will run for two months in both the *Jersey Broadcaster* and the *Delaware Valley Oscillator*. All buying and selling transactions are the responsibility of the parties involved.

**FOR SALE**

Check out NJARC's capacitor program for those most commonly needed replacements. Contact John Ruccolo at any club meeting or call him at home (609)-426-4568 to find out what's available. All proceeds go to the club.

**SUPPORT THE SARNOFF LIBRARY****SUPPORT INFOAGE**

See Marv Beeferman

The NJARC tube program offers clean, tested, boxed tubes at very reasonable prices with availability at any club meeting (no dealers, please...not for resale). Proceeds go to the club. Of course, donations of radio-type tubes in any condition are welcome. See Gary D'Amico at the next meeting.

WW2 Navy/Marine TCS9 TX & RX built by Collins. W/copy of manual and 2 dynamotors, remote control box and most of the connecting cables. Was operated on ham bands OK. \$400 firm + SH or pick up in Freehold, NJ

Philco 50 - operates OK, cabinet needs refinishing. \$50 firm +SH or pickup.

Steve Kiraly, 732-462-2705 between 5-8 PM.

McMurdo Silver Masterpiece V chassis w/o case or speaker...in nice condition. Best offer over \$500 by December 31, 2005. Pics available upon request.

Six-foot electronics rack with Bell tape deck, Magnacorder, RCA attenuator with sticker (B/c xmitter), General Radio low distortion oscillator and D/s control panel with various controls and meter. Best offer over \$200...pics available on request.

Don Baldwin, 609-654-0344/donmervin@verizon.net.

Are you aware that NJARC now has a resistor program which includes many commonly needed replacements? Contact Walt Heskes at any club meeting for details.

Winter cleaning sale: Shortwave radios - Hallicrafters SX99 \$100, SX130 \$120, SX-43 \$130, Lafayette HA225 \$70, BC348 \$65, Heathkit G4-1680 \$65.

Test equipment - HP 400D AC voltmeters, 1mV to 300V full scale, 4MHz bandwith, great for measuring gain in broadcast band radios, audio work, etc., good operating condition, \$10. Measurements grid dip meter with book, \$50. Tube testers, distortion analyzers, spectrum analyzer, scopes, etc. available - ask. Near recent (1980s?) stereo equipment receivers, tuners, turntables, \$10 each (working).

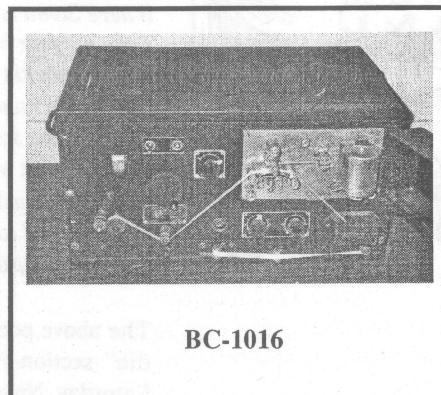
Parts available: Tek465, Philips 3052 and various other HP and Tek equipment. Steve Goulart, 732-219-6963, sgoulart@att.com

**WANTED**

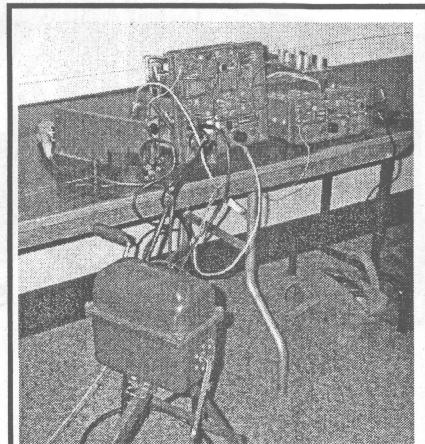
By non-member: Looking for these two RCA portables for the last seven years - RCA 6QP3 and 36QP. Tuckerelt@aol.com

**SEEN AT OUR NOVEMBER MEETING**

GRC-9



BC-1016



CRI-43044